Office of Chief Counsel
Internal Revenue Service

memorandum

CC: [redacted] TL-N-6026-99

date: NOV 04 1999

to: Examination Division, [redacted]
ATTN: [redacted] Team Coordinator

from: Associate District Counsel, [redacted]

subject: [redacted]
Research Credit - Process

This memorandum responds to your request for advice on whether the process employed by [redacted] (the "Taxpayer") in building the [redacted] qualifies for the research credit under I.R.C. § 41.

DISCLOSURE STATEMENT

This advice constitutes return information subject to I.R.C. § 6103. This advice contains confidential information subject to attorney-client and deliberative process privileges and if prepared in contemplation of litigation, subject to the attorney work product privilege. Accordingly, the Examination or Appeals recipient of this document may provide it only to those persons whose official tax administration duties with respect to this case require such disclosure. In no event may this document be provided to Examination, Appeals, or other persons beyond those specifically indicated in this statement. This advice may not be disclosed to taxpayers or their representatives.

This advice is not binding on Examination or Appeals and is not a final case determination. Such advice is advisory and does not resolve Service position on an issue or provide the basis for closing a case. The determination of the Service in the case is to be made through the exercise of the independent judgment of the office with jurisdiction over the case.

ISSUE

Whether the Taxpayer's use of [redacted] in the construction of the [redacted] constitutes "qualified research" within the meaning of I.R.C. § 41(d)?

CONCLUSION

No. The concept of [redacted] was first used in the construction of Liberty ships during World War II. The Taxpayer has not shown that it developed a new [redacted] process or improved on the concept used during World War II or by the Japanese. In addition, the Taxpayer has not identified (1) any activities associated with the development or improvement of the process that the Service can evaluate using the tests prescribed by I.R.C. § 41(d) or (2) any expenses paid or incurred with respect to such development or improvement.

FACTS

The Taxpayer is a [redacted] corporation engaged in the business of ship design, construction, and repair.

On [redacted], the Taxpayer won a $[redacted] contract to design and build the [redacted] with options to build [redacted] additional [redacted]. The Taxpayer began construction of the [redacted] in [redacted].

In its proposal for the construction of the [redacted], the Taxpayer outlined its design and construction approach. The Taxpayer's approach was based on the use of "[redacted]." [redacted]. The Taxpayer further described the approach as follows:

[redacted]

[redacted]

[redacted]. Specifically, the taxpayer stated:

[redacted]

. . .

[redacted]

[redacted]

. . .

[redacted]. Attached are additional excerpts from the Taxpayer's [redacted].

On [redacted], the Taxpayer filed Amended U.S. Corporation Income Tax Returns, Form 1120X, for the years [redacted], [redacted], and [redacted]. The Taxpayer did not specifically identify the items that qualify for the research credit. During the examination, the Taxpayer asserted that all of the labor and materials associated with the [redacted] qualify as qualified research expenses, because the [redacted] is the [redacted]. The Taxpayer also has asserted that the process, "[redacted]," used to construct the [redacted] qualifies as qualified research, because the [redacted] was the first project in which the Taxpayer used the process. The Taxpayer, however, has not identified the expenses or activities associated with the development and implementation of the process. The Taxpayer apparently has asserted that the process represents the single largest item in its claim for refund but that it cannot specifically identify the expenses and activities associated with the process, because the process is integrated into virtually every piece of the ship. In support of its position that the process was experimental and qualifies for the research credit, the Taxpayer points to the substantial cost over-runs incurred in the construction of the [redacted].

You have asked for our opinion regarding the merits of the Taxpayer's claim as it relates to the process.

DISCUSSION

I. LAW

I.R.C. § 41 allows a taxpayer a credit against tax for increasing research activities. Generally, the credit is an incremental credit equal to the sum of 20 percent of the excess, if any, of the taxpayer's qualified research expenses for the taxable year over the base amount plus 20 percent of the taxpayer's basic research payments. I.R.C. § 41(a).

The term "qualified research expenses" means the sum of in-house research expenses and contract research expenses which are paid or incurred by the taxpayer during the taxable year in carrying on any trade or business. I.R.C. § 41(b)(1). The term "in-house research expenses" means (1) any wages paid or incurred to an employee for qualified services performed by such employee, (2) any amount paid or incurred for supplies used in the conduct of qualified research, and (3), as prescribed by regulation, any amount paid or incurred to another person for the right to use computers in the conduct of qualified research. I.R.C. § 41(b)(2)(A). The term "qualified services" means services consisting of engaging in qualified research or engaging in the direct supervision or direct support of research activities which constitute qualified research. I.R.C. § 41(b)(2)(B).

I.R.C. § 41(d) defines the term "qualified research" to mean research:

1. with respect to which expenditures may be treated as expenses under I.R.C. § 174;
2. Which is undertaken for the purpose of discovering information (a) which is technological in nature and (b) the application of which is intended to be useful in the development of a new or improved business component of the taxpayer; and
3. substantially all of the activities of which constitute elements of a process of experimentation for the purpose of (a) a new or improved function, (b) performance, or (c) reliability or quality.

I.R.C. §§ 41(d)(1) and (3). The term, however, does not include, among other things, any research conducted after the beginning of commercial production of the business component. I.R.C. § 41(d)(4)(A). Or stated differently, expenses are not eligible for the research credit "after the component has been developed to

the point where it either meets the basic functional and economic requirements of the taxpayer for such component or is ready for commercial sale or use." H. Conf. Rept. 99-841 (Vol. II), 99th Cong. 2nd Sess. II-74 (1986), 1986-3 (Vol. 4) C.B. 1, 74 (footnote omitted). For example, the credit is not available for expenses such as "'troubleshooting' involving detecting faults in production equipment or processes, accumulation of data relating to production processes, and the cost of 'debugging' product flaws." Id.

The principles of I.R.C. § 41(d) are applied separately to each business component of the taxpayer. I.R.C. § 41(d)(2). A "business component" of the taxpayer is any product, process, computer software, technique, formula, or invention which is held for sale, lease, or license or which is used by the taxpayer in a trade or business. I.R.C. § 41(d)(2)(B). Any plant process, machinery, or technique for commercial production of a business component is treated as a separate business component and not as part of the business component being produced. I.R.C. § 41(d)(2)(C).

The I.R.C. § 174 Test

The expenses paid or incurred with respect to research allegedly qualifying for the research credit under I.R.C. § 41 must qualify as "research and experimental expenses" as defined for purposes of I.R.C. § 174. I.R.C. § 41(d)(1)(A). The term "research and experimental expenses" means expenditures which represent research and development costs in the experimental or laboratory sense. Treas. Reg. § 1.174-2(a)(1).

> Expenses represent research and development costs in the experimental or laboratory sense if they are for activities intended to discover information that would eliminate uncertainty concerning the development or improvement of a product. Uncertainty exists if the information available to the taxpayer does not establish the capability or method for developing or improving the product or the appropriate design of the product. Whether expenditures qualify as research or experimental expenditures depends on the nature of the activity to which the expenditures relate, not the nature of the product or improvement being developed or the level of technological advancement the product or improvement represents.

Id. The term "product" means any pilot model, process, formula, invention, technique, patent, or similar property. Treas. Reg. § 1.174-2(a)(2).

The Discovery Test

To qualify as "qualified research" for purposes of I.R.C. § 41, the research must be undertaken for the purpose of discovering information which is technological in nature. I.R.C. § 41(d)(1)(B)(i).

> The determination of whether the research is undertaken for the purpose of discovering information that is technological in nature depends on whether the process of experimentation utilized in the research fundamentally relies on principles of the physical or biological science, engineering, or computer science - in which case the information is deemed technological in nature - or on other principles, such as those of economics - in which case the information is not to be treated as technological in nature. For example, information relating to financial services or similar products (such as new types of variable annuities or legal forms) or advertising does not qualify as technological in nature.

H. Conf. Rept. 99-481 (Vol. II) at II-71 to II-72 (1986) 1986-3 C.B. (Vol. 4) at 71-72 (footnotes omitted).

The legislative history of I.R.C. § 41 dictates that the knowledge gained from the research and experimentation must be that which exceeds what is known in the field in which the taxpayer is performing the research and experimentation. Norwest Corp. and Subsidiaries v. Commissioner, 110 T.C. 454, 493 (1998). The fact that the information is new to the taxpayer, but not new to others, is not sufficient for such information to come within the meaning of discovery for purposes of this test. Id.

The Business Component Test

To qualify as "qualified research" for purposes of I.R.C. § 41, the research must be undertaken for the purpose of discovering information the application of which is intended to be useful in the development of a new or improved business component of the taxpayer. I.R.C. § 41(d)(1)(B)(ii).

> [R]esearch is treated as conducted for a functional purpose only if it relates to a new or improved function, performance, reliability, or quality. (Activities undertaken to assure achievement of the intended function, performance, etc. of the business component after the beginning of commercial production of the component do not constitute qualified experimentation.) The conference agreement also provides that research relating to style, taste, cosmetic, or seasonal design factors is not treated as conducted for a functional purpose and hence is not eligible for the credit.

H. Conf. Rept. 99-841 (Vol. II) at II-72, 1986-3 (Vol. 4) at 72. Congress only intended that the taxpayer's activities provide some level of functional improvement, at a minimum. Norwest, 110 T.C. at 495.

The Process of Experimentation Test

The research allegedly eligible for the research credit under I.R.C. § 41 must involve activities substantially all of which constitute elements of a process of experimentation relating to a new or improved function, performance, reliability, or quality. I.R.C. §§ 41(d)(1)(C) and (d)(3).

> The term process of experimentation means a process involving the evaluation of more than one alternative designed to achieve a result where the means of achieving that result is uncertain at the outset. This may involve developing one or more hypotheses, testing and analyzing those hypotheses (through, for example, modeling or simulation), and refining or discarding the hypotheses as part of a sequential design process to develop the overall component.
>
> Thus, for example, costs of developing a new or improved business component are not eligible for the credit if the method of reaching the desired objective (the new or improved product characteristics) is readily discernible and applicable as of the beginning

> of the research activities, so that true experimentation in the scientific or laboratory sense would not have to be undertaken to develop, test, and choose among the viable alternatives. On the other hand, costs of experiments undertaken by chemists or physicians in developing and testing a new drug are eligible for the credit because the researchers are engaged in scientific experimentation. Similarly, engineers who design a new computer system, or who design improved or new integrated circuits for use in computer or other electronic products, are engaged in qualified research because the design of those items is uncertain at the outset and can only be determined through a process of experimentation relating to specific design hypotheses and decisions as described above.

H. Conf. Rept. 99-841 (Vol. II) at II-72, 1986-3 (Vol. 4) at 72.

The Process of Experimentation Test requires uncertainty at the outset about the ability to develop the product in a scientific or laboratory sense. Norwest, 110 T.C. at 496. By requiring this, the test is aimed at eliminating uncertainty about whether the taxpayer has the technical ability to develop the product, not uncertainty about whether the taxpayer can develop the product within certain business or economic constraints, even though the taxpayer knew that it was technically possible to develop it. Id.

The Process of Experimentation Test also imposes a more structured method of discovery than the tests in I.R.C. § 174. Id. Specifically, it mandates the evaluation of more than one alternative, which may involve a structured process of experimentation through the continuous development of hypotheses that require testing and analysis until the method of reaching the objective is discovered. Id.

In sum, the test requires that at least 80 percent of the activities engaged in by the taxpayer with respect to the pre-production or implementation development of a product must involve the development, testing, and analysis of hypotheses that are designed to eliminate technical uncertainty as to the development of that product. Id. at 497.

II. ANALYSIS

The Taxpayer has claimed a research credit for activities in which it engaged in the construction of the [redacted]. One element of the Taxpayer's claim is the use of a process, [redacted], which the Taxpayer allegedly had not used prior to the construction of the [redacted].

[redacted]

. . .

[redacted]

Draft Response to [redacted] dated [redacted], from [redacted], the Taxpayer's representatives, to the

Service, pp. [redacted]. The Taxpayer, however, has not identified the activities or expenses associated with developing the [redacted] process.

We do not believe that the Taxpayer has met the requirements of I.R.C. § 41 for claiming a credit with respect to the process known as [redacted].

Separate Business Component

A process or technique for commercial production of a business component is treated as a separate business component and not as part of the business component being produced. I.R.C. § 41(d)(2)(C). Therefore, the Taxpayer must establish that the development of the process by itself qualifies as qualified research and substantiate the costs associated with the development of the process (and not the ship).

To date, the Taxpayer has not identified the expenses or activities associated with the process. The Taxpayer apparently has argued that the substantial cost over-runs on the [redacted] project are proof that the process was experimental and qualified for the research credit.

We disagree. First, assuming for the moment that the process qualifies for the research credit, the Taxpayer must establish the costs of <u>developing</u> the process, not <u>detecting and correcting</u> faults in the process. H. Conf. Rept. 99-841 (Vol. II) at II-74, 1986-3 (Vol. 4) C.B. at 74. If the substantial cost over-runs did, in fact, result from using the process, they did not result from costs associated with <u>developing</u> or improving the process. The Taxpayer had developed the process prior to the [redacted] and, at best, needed to iron out the application of the process to that ship. Second, the substantial cost over-runs were not attributable to the application of the process to the [redacted]. The Taxpayer has provided "An Analysis of [redacted] Requests for Deviation" which explains the cost over-runs.

[redacted]

[redacted]

[redacted]

Research after Commercial Production

The term "qualified research" does not include any research conducted "after the business component has been developed to the point where it either meets the basic functional and economic requirements of the taxpayer for such component or is ready for commercial sale or use." H. Conf. Rept. 99-841 (Vol. II) at II-74, 1986-3 (Vol. 4) C.B. at 74.

In its proposal, the Taxpayer admits to having used the process in the construction and conversion of other ships. For example, the Taxpayer stated:

[redacted]

[redacted]

[redacted] (emphasis added). By its own admission, therefore, the Taxpayer found that, prior to its application to the [redacted], the process met its basic functional requirements and was ready for use. Even assuming that the Taxpayer needed to refine the process during the construction of the [redacted], the refinements would not constitute qualified research, unless they resulted in significant improvements in the process. See H. Conf. Rept. 99-841 (Vol. II) at II-74 fn.4, 1986-3 (Vol. 4) C.B. at 74 fn.4. Thus, the alleged research claimed by the Taxpayer with respect to the process does not constitute qualified research because it was conducted after the beginning of commercial production.

Other Tests

The Taxpayer has not provided any information suggesting that any research associated with the process meets any of the tests set forth in I.R.C. § 41(d).

The concept of [redacted] was introduced by Henry J. Kaiser during World War II with the Liberty ships. Liberty ships were mass produced with prefabricated sections and built in short periods of time, including the record of four days and 15 hours.

> . . . Sixty-one percent of the ship was prefabricated, with more than 152,000 feet of weld performed on the assembly line. A total of 97 prefabricated sections were trucked from the prefab plant to the ways. The hull was assembled in huge 250-ton "chunks" swung into place with all interior fittings - even mirrors, bunk ladders, portholes, washbasins, and radiators - already installed. . . .
>
> Building hulls was only part of the ship construction story. While shipyards won headlines for launching Libertys in a matter of day, the ships they built would have been useless if subcontractors all over the country had not made scheduled deliveries of the vast

> variety of machinery and equipment that went into them. . . .

John G. Bunker, Liberty Ships: The Ugly Ducklings of World War II, 12-13 (1972).

> Component parts were consumed virtually non-stop and it was quite commonplace to see, say, complete deckhouses erected upside-down on a wheeled trolley and then inverted and placed in position. Also it became quite customary to see stock-piles of double-bottom sections with all piping already installed, waiting to be dropped complete on to the keels. Other stock would include complete stern-frame assemblies and even complete bow units.

John S. Lindsay, The Liberty Ships: The History of the "Emergency" Type Cargo Ships Constructed in the United States During World War II, 19 (1970).

Interestingly, the Taxpayer did not learn its [redacted] techniques from Henry Kaiser; it learned the techniques from [redacted].

In 1984, [redacted] dispatched its technical experts to [redacted] to guide the Taxpayer on how to improve productivity and other related operations. [redacted].

[redacted]

. Id.

And with the new techniques, the Taxpayer could offer competitive prices. " . ." , at (quoting , the Taxpayer's). This capability brought substantial business to the Taxpayer in converting and into and remaking into . Id. (citing . By copying the shipbuilding techniques learned from the , the Taxpayer also was able to seek and win a contract with to build , the , the Taxpayer's board chairman and chief executive officer).

The new techniques also pleased the Taxpayer's employees. The change most acceptable to the employees was assembling, wiring, and installing equipment in separate units in the yard, as opposed to within the tight confines of ship's superstructure. After completion in the yard, the units are lifted by crane aboard the ship and welded into place. Id.

As shown by the and statements made by the Taxpayer's , the Taxpayer converted to the process at least two years before it won the contract to build the . And the Taxpayer converted to a process that sounds to that used in constructing the Liberty ships. In , the process is described as a " ." , . In its proposal for the class , the Taxpayer stated, with respect to one element of the process, " ." In , complete deckhouses of the Liberty ships were "erected upside-down on a wheeled trolley then inverted and placed into

position." Lindsay, The Liberty Ships, supra, at 19. In its proposal, the Taxpayer stated,

[redacted]

[redacted] In constructing the Liberty ships,

> Steel plates and shapes entered a holding area in the yard on its inland side, and passed through a large prefabrication area where major sections of the ship were constructed. The sections were then transported on rails or by moveable cranes to one of the ways, where large cranes lifted them onto the hull for final assembly.

Peter Thompson, How Much Did the Liberty Shipbuilders Learn? New Evidence for an Old Case Study, Submission to J. Pol. Econ. 3(May 1999). In its proposal for the [redacted], the Taxpayer stated,

[redacted]

[redacted]

Without additional information, therefore, the Taxpayer will have difficulty satisfying the four tests under I.R.C. § 41(d). At this stage, the Taxpayer has not shown that it developed a new process for constructing ships or improved an old process. Not only did the Taxpayer use the [redacted]

process in the construction of several ships prior to the [redacted], but shipbuilders during World War II and the Japanese also used the [redacted] process in the construction of the Liberty ships and other ships prior to the [redacted] The Taxpayer did not nothing more than apply an old process to a new ship. Even assuming that the Taxpayer improved on this old process, the Taxpayer has not established (1) that there was an uncertainty relating to its technical ability to improve the process, (2) that the knowledge it gained from its research for the improved process exceeded what was already known in the field, or (3) that it developed, tested, and analyzed one or more hypotheses in developing the improved process.

If you have any questions, please call the undersigned at [redacted].

[redacted]
Assistant District Counsel

By: [redacted]
Attorney

Attachments